



Positron GAM and XGS-PON Integration

Calix EAP Summary and Notes

Version: 5
September 27, 2023

Table of Contents

1	Introduction	2
2	P-XGS-PON-ONT Summary Features	2
3	Integration with Calix SMX (AXOS 23.2 / 23.3)	3
4	Assigning in-band management IP address (defining a “dummy” service)	3
5	Defining a service via SMX and applying to the G.hn Endpoint assigned to a Subscriber	8
6	XGS-PON OLT Provisioning Recommendations	9
7	Positron GAM requirements	10
8	Known Limitations, Outstanding and Resolved Issues:.....	11
9	Appendix A: GAM Firmware Update Procedure for Version 2.0.....	14
9.1	SFP+ ONT Firmware Update Procedure (via CLI)	20

Revision History

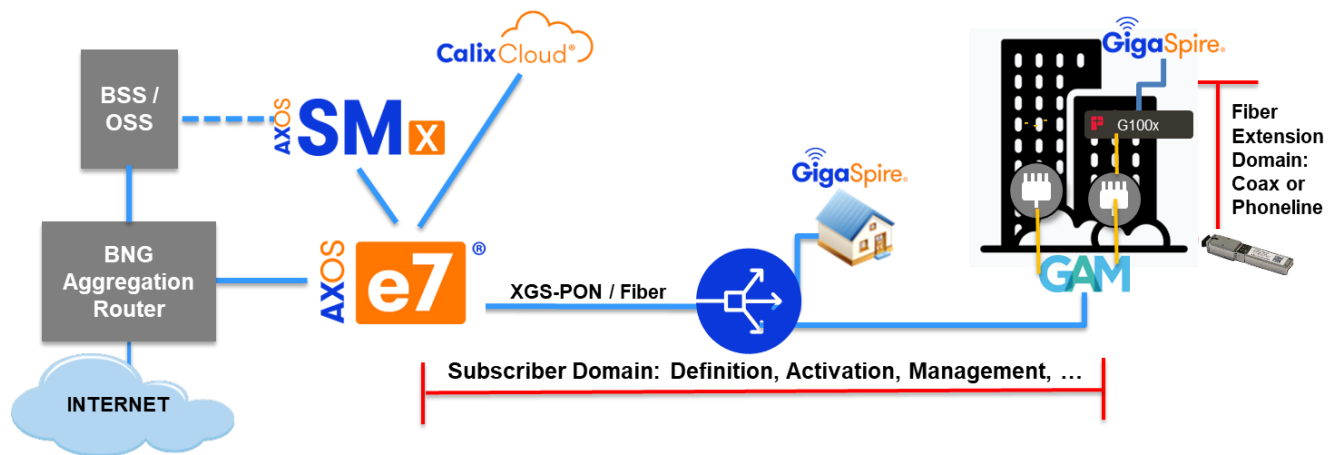
Author	Revision	Summary
Pierre Trudeau	Draft 1 (July 28, 2023)	Initial version
Pierre Trudeau	Draft 2 (August 7, 2023)	Clarify lack of support for Double VLAN tagging
Pierre Trudeau	Draft 3 (August 14, 2023)	Insert CLI scripts provided by M. McAlpin (Calix)
Jeff Kidd	Draft 4(September12, 2023)	Updates and SMX provisioning steps
Jeff Kidd	Draft 5(September 27,2023)	Insert GAM upgrade instructions

1 Introduction

The Positron GAM family (running V2.0) now integrates seamlessly with Calix XGS-PON (running Version 23.2 or more recent) to allow the provisioning and management of subscribers and their services natively, just like any other XGS-PON ONT.

Using the new Positron P-XGS-PON-ONT on a stick (SFP+), a Positron GAM now appears as an ONT with support for up to 24 Gigabit Ethernet port. **Note:** the limitation of 24 ports per ONT is a limitation of AXOS. Please refer to the section on Provisioning Guidelines for more information.

The following diagram shows how a Positron GAM fitted with one P-XGS-PON-ONT integrates seamlessly within the Calix AXOS and Cloud solution set.



Looking at the diagram above, subscriber and services settings are extracted from the BSS via Calix SMX and pushed to the GAM by the Calix E-series OLT via OMCI messages. The P-XGS-PON-ONT interfaces with the GAM to enforce the provisioning and activation commands. It also reports OAM information from the GAM that is requested by the OLT, SMX and the Calix Cloud (Operations, Support & Marketing).

2 P-XGS-PON-ONT Summary Features

The P-XGS-PON-ONT is an SFP+ device fully compliant with the ITU-T G.9801.1 XGS-PON specifications. Here is a summary of the key features of the SFP+:

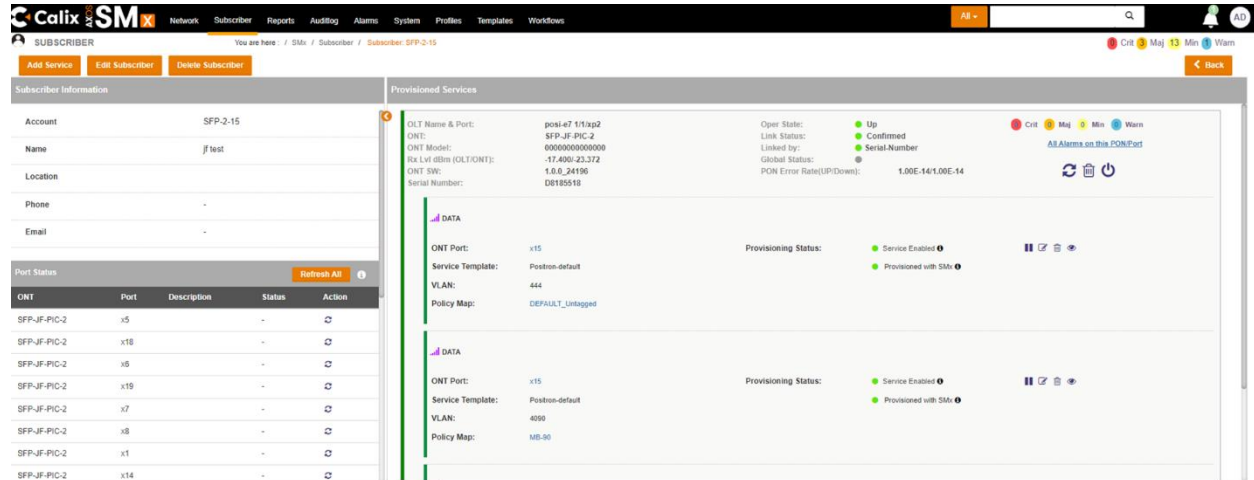
- SFP type laser, SC/APC or SC/UPC connector
- 10G bps Burst Mode Upstream Transmitter
- 10G bps Downstream Receiver
- Compliant with ITU-T G.9807 Class N1
 - APD receiver and DFB transmitter
 - 4~+9dBm launch power
 - -28.5 dBm sensitivity BER $\leq 1 \times 10^{-3}$
 - -8dBm overload /
 - 20km distance
- Wavelengths (XGS-PON): US 1260nm to 1280nm, DS 1575nm to 1580nm



- Laser compliant with FCC 47 CFR Part 15, Class B, and FDA 21 CFR 1040.10 and 1040.1
- Multiple T-CONTs per device
- Multiple XGEM Ports per device

3 Integration with Calix SMX (AXOS 23.2 / 23.3)

The P-XGS-PON-ONT and the GAM will appear as a 24-port ONT to an E-Series Calix OLT running AXOS 23.2 or more recent. Here is a summary view of a Positron GAM with up to 24 Gigabit Ethernet ports.



When defining an ONT profile for the P-XGS-PON-ONT SFP+ of a GAM, you will be able to set each of the 24 interfaces as Ethernet x1-x24. **Note:** although the subscriber ports of the G100x Endpoint devices are limited to a maximum of 1 Gbps, each Ethernet port of the ONT must currently be defined as 10 Gbps interfaces **x1-x24** because setting them as **g1-g24** will result in performance issues. This is under investigation by Positron and we will provide a fix as soon as possible.

4 Assigning in-band management IP address (defining a “dummy” service)

The GAM WEB Gui and CLI is accessible via an in-band management IP address. This management IP can be assigned via DHCP or statically configured via the OLT. While this is optional, the in-band management is needed for firmware upgrades and for access to the advanced management and troubleshooting features of the GAM. To configure a Host Interface to the GAM for in-band management, you will need to configure a “dummy” media gateway interface on the E-series OLT.

Starting with AXOS 23.2 you can now provision the in-band management. To enable this feature when creating a new service, it is necessary to enable this new field as per the screenshot below.

Modify ONT Profile

***Name:** GAM-12

***Type:** Residential

Description: Enter Description

Vendor Id: PNID

Model: Enter Model

Mapped Interfaces for MDU ONTs: Enable Disable

PsE max Power Budget: 0

PsE max Power Budget Limit: 0

Ten Gig Eth: 12

Gig Eth: Enter Gig Eth

Fast Eth: Fast Eth

RF Video: Enter RF Video

Voice POTS: 1

Voice / T1 ONT UA: 1

T1: Enter T1

ETH-OAM-Support: None

RG:

```

ont-profile GAM-12
vendor-id PNID
interface ont-ethernet x1
alarm-suppression ENABLED
!
interface ont-ethernet x2
alarm-suppression ENABLED
!
interface ont-ethernet x3
alarm-suppression ENABLED
!
interface ont-ethernet x4
alarm-suppression ENABLED
!
interface ont-ethernet x5
alarm-suppression ENABLED
!
interface ont-ethernet x6
alarm-suppression ENABLED
!
interface ont-ethernet x7
alarm-suppression ENABLED
!
interface ont-ethernet x8
alarm-suppression ENABLED
!
interface ont-ethernet x9
alarm-suppression ENABLED
!
interface ont-ethernet x10
alarm-suppression ENABLED
!
interface ont-ethernet x11
alarm-suppression ENABLED
!
interface ont-ethernet x12
alarm-suppression ENABLED
!
interface pots p1
!
interface ont-ua 1
!
!
!
    
```

er Reports Auditlog Alarms System Profiles Templates Workflows All

re : / SMx / Profiles / Service Profile / MGCP Profile Crit 37 Maj 7 Min 4 Warn

Global MGCP Profile

Import/Delete Export

Name	Pri-GW-Controller	Sec-GW-Controller	Term-Prefix	Retry-Timeout	Restart-Delay	Flash-Hook-Persist	On-Hook-Persist	Off-Hook-Persist	Actions
GAM-mgmt	10.56.12.200	0.0.0.0	aaIn	30	1	false	false	false	

Showing 1 to 1 of 1 entries Rows Per Page : 100 < < 1 > >

Add Profile

mgcp-profile GAM-mgmt
 pri-gw-controller 10.56.12.200

Modify Service

Override

Service Type:	Voice service	<input type="checkbox"/>
VLAN:	Specified in service	<input checked="" type="checkbox"/>
Global VLAN ID:	Please Select Global VLAN ID	<input checked="" type="checkbox"/>
Configure C-VLAN:		<input checked="" type="checkbox"/>
Global C-VLAN Range:	Enter Global C-VLAN Range value 1-4094	
Service Description:	Enter Service Description	<input checked="" type="checkbox"/>
Option82 Action:	insert	<input type="checkbox"/>
Policy Map:	DEFAULT_Untagged	<input checked="" type="checkbox"/> +
Policy Map Attribute Override:		<input type="checkbox"/>
Egress Shaper Override:		<input checked="" type="checkbox"/>
Ingress Meter Override:		<input checked="" type="checkbox"/>
Port Description:	Enter Port Description	<input checked="" type="checkbox"/>
Retain Port Description on Service Deletion:		<input type="checkbox"/>
PPPoE-IA:	Admin-State: disabled	<input checked="" type="checkbox"/>
SIP Profile:	Please select	<input type="checkbox"/> +
MGCP Profile:	GAM-mgmt	<input type="checkbox"/> +
TDMGW Profile:	Please select	<input type="checkbox"/> +
H248 Profile:	Please select	<input type="checkbox"/> +
DSCP Map:	Please select	<input type="checkbox"/> +

Subscriber **\$\$** [Add Subscriber](#)

Service Provisioning > Antwerp_ET_02 > gam-m [Change Port Roles](#)

ONT Ports* [Add Service](#)

p1

Service Template* GAM_mgmt	VLAN* 422	Policy Map* DEFAULT_Untagg	MGCP Profile GAM-mgmt	DSCP Map
Global VLAN ID* 0		GR-303 false	Ingress Meter EIR	Egress Shaper Max
		IP Allocation STATIC	Static IP 10.247.2.253/24	Gateway IP 10.247.2.1
		Hostname	DHCP Client id	Ping true
		Traceroute true	Service Description	Port Description
		PPPoE-IA Admin-State disabled		

Use Static IP addressing, which is not the default, but if you select Static in the IP Allocation field, the other fields appear.

Calix **SM** Network Subscriber Reports Auditlog Alarms System Profiles Templates Workflows All

SUBSCRIBER You are here / Sdk / Subscriber / Subscriber: Positron-Test-SFP Crit

[Add Service](#) [Edit Subscriber](#) [Delete Subscriber](#)

Subscriber Information		Provisioned Services	
Account	Positron-Test-SFP	OLT Name & Port:	E7-RTE106-NUCO-05 1/1/tp4
Name	Positron-Test-SFP	ONT:	Positron-Test-SFP
Location	MN, 56073	ONT Model:	P-PCS-ONT-SFP
Phone	-	Rx Lvl dBm (OLT/ONT):	-16.900/-16.574
Email	-	ONT SW:	1.1.0_24413
Port Status	Refresh All	Serial Number:	D81855A8
ONT	Port	Description	Status
Positron-Test-SFP	p1		up

Oper State: ● Up ● Crit ● Maj ● Min ● Wa

Link Status: ● Confirmed ● Serial-Number

Global Status: ● Global

PON Error Rate(UP/Down): 1.00E-14/1.00E-14 [All Alarms on this PON/Port](#)

Voice service

ONT Port: p1 Provisioning Status: ● Service Enabled ● Provisioned with SM

Service Template: Positron-Test-SFP

VLAN: 62

Policy Map: DEFAULT_Untagged

Calix **SM** Network Subscriber Reports Auditlog Alarms System Profiles Templates Workflows

TEMPLATES You are here / Sdk / Templates / ONT Ethernet Template / Template: Positron-Test-SFP

Node

Port

Service

Gfast Only

AXOS Systems

CPE

Template Basic Information Services

Template Basic Information

Name	Description	Admin State
Positron-Test-SFP		enabled

Service

Service Type :	Voice service
VLAN :	Specified in service
Configure VLAN :	true
Global VLAN ID :	MGMT
Configure Global VLAN ID :	true
Global C-VLAN Range :	
Configure C-VLAN :	true
Service Description :	
Configure Service Description :	true
OptionR2 Action :	Insert
Configure OptionR2 Action :	false
Policy Map :	DEFAULT_Untagged
Configure Policy Map :	true
Port Description :	
Configure Port Description :	true
Retain Port Description on Service Deletion :	false
PON CDS :	

PON-COS Configure :	false
PON Upstream Profile :	
Configure PON Upstream :	false
PPPoE-IA Admin-State :	enabled
Configure PPPoE-IA Admin-State :	true
MGCP Profile :	Test-JF-INBAND
Configure MGCP Profile :	false
TDMGW Profile :	
Configure TDMGW Profile :	false
H248 Profile :	
Configure H248 Profile :	false
SIP Profile :	
Configure SIP Profile :	false
Dial Plan :	
Configure Dial Plan :	false
Egress Shaper Override :	true
Ingress Meter Override :	true
Policy Map Attribute Override :	false
DSCP Map :	
Configure DSCP Map :	false

[← Back](#)



Here is how this is done via the CLI:

```

mgcp-profile dummy
pri-gw-controller 10.56.12.200
!
vlan 422
description "inband GAM management"
egress flooding ENABLED
!
interface ont-ua gam-m/1
vlan 422
policy-map Data_100-100
!
ip address 10.247.2.253/24
ip gateway 10.247.2.1
!
mgcp-profile dummy
!
interface pots gam-m/p1
mgcp-service 1
!
!

```

```

interface ont-ua gam-m/1
status
admin-status enable
oper-status up
mac-address 00:0e:d8:17:c8:4e
current-ip
address      10.247.2.253/24
gateway      0.0.0.0
primary-dns-server 0.0.0.0
secondary-dns-server 0.0.0.0
l3-hosts
l3-host vlan 422 ip 10.247.2.253
mask         255.255.255.0
mac          00:0e:d8:17:c8:4e
gateway1     10.247.2.1
host-type    provisioned
up-down-state up

```

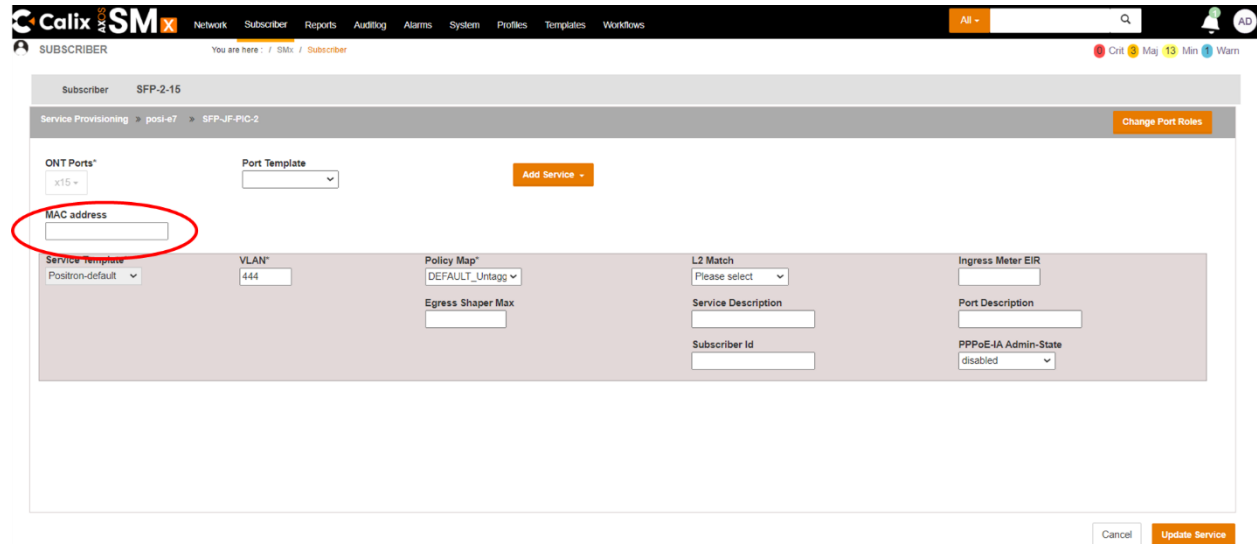
5 Defining a service via SMX and applying to the G.hn Endpoint assigned to a Subscriber

Starting with AXOS 23.2, it is now possible to use SMX to specify the MAC address of the Positron G.hn endpoint to be assigned to a subscriber service. In order to enable this feature when creating a new service, it is necessary to enable this new field as per the screenshot below, otherwise the MAC Address field will not appear.

The screenshot shows the 'Modify ONT Profile' configuration page for profile 'GAM-12'. The 'Mapped Interfaces for MDU ONTs' checkbox is circled in red and is checked. The configuration details are as follows:

*Name:	GAM-12
*Type:	Residential
Description:	Enter Description
Vendor Id:	PNID
Model:	Enter Model
Mapped Interfaces for MDU ONTs:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
PsE max Power Budget:	0
PsE max Power Budget Limit:	0
Ten Gig Eth:	12
Gig Eth:	Enter Gig Eth

With the above “Mapped Interfaces” option enabled, the new field for the MAC address of the Positron G100x Endpoint will appear. **Note:** While you can configure this value for each services assigned to a Subscriber, you only have to specify the MAC address for one of the services assigned to a Subscriber.



When defining Services, the following settings are supported:

- **VLAN:** the GAM supports single and double (Q-in-Q) VLAN tagging. You can specify the following VLAN tag handling to be performed on the GigE port of the G100x Endpoint connected to the user device (usually a Residential Gateway): Tagged, Untagged or Remap.
- **Ingress metering:** the GAM enforces Ingress (upstream) metering for each service as defined.
- **Multiple Ethernet devices (bridge mode):** you can set up to 8 different devices (or MAC addresses) per Ethernet ports of the ONT. **Note:** you can define or more services and VLANs in bridge mode.

The Positron GAM can operate in Point-to-Multipoint mode over coax (up to 16 G.hn endpoint per coax port). The GAM also supports operation in Point-to-Point mode over coax and copper (telephone) wiring.

NOTE: the Positron GAM can also operate in Port Aware mode over copper (telephone) pairs. In this mode, there is no need to specify the MAC address of the G.hn endpoint. The index of the Gigabit port of the ONT (x1 to x24) will be mapped to the corresponding G.hn port of the GAM (G.hn-1 to G.hn-24). When selecting to operate in Port Aware mode, this must currently be manually configured in the GAM. Positron will add support to automatically detect this in a future firmware update.

6 XGS-PON OLT Provisioning Recommendations

For planning purposes, Calix and Positron recommend serving G.hn MDU installations with XGS-PON using a dedicated XGS-PON port on the E-series OLT. A dedicated XGS-PON port allows for ease of planning future MDU take rate expansion, traffic load balancing, and troubleshooting. AXOS supports an MDU size up to 24 subscribers per ONT. We recommend no more than five (5) G.hn MDUs (5 MDUs x 24 subscribers = 120 subscribers) be served on a single XGS-PON port.

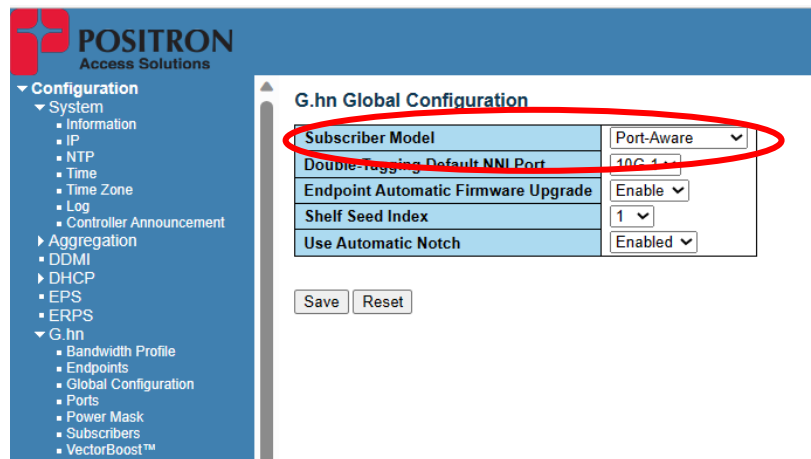
7 Positron GAM requirements

Version 2.0 or greater will support the P-XGS-PON-ONT and is supported on all GAM devices. At this time, a GAM device is limited to a single P-XGS-PON-ONT. You can use any of the SFP+ of the GAM for the P-XGS-PON-ONT.

Existing GAM devices running an older version of the firmware must be upgraded to Version 2.0 to support the P-XGS-PON-ONT. Since the size of the version 2.0 of the GAM firmware exceeds the previous limit of 32MB, you will need to first install version 1.5.3 and then install version 2.0. Please refer to Appendix A for the procedure for this 2-step update process.

Note: since the OMCI management layer of XGS-PON does not support a sub-interface for a Gigabit port, it is not possible to configure services that run over the 2nd GigE port of G1002-series Endpoint devices.

You can use the WEB GUI of the GAM to set its operation in Port-Aware mode by selecting **Configuration->G.hn->Global Configuration** as per the example below and making sure the Subscriber Model is set to Port-Aware.



The screenshot displays the Positron Access Solutions web interface. On the left is a navigation menu with 'Configuration' expanded to show 'G.hn' and 'Global Configuration'. The main content area is titled 'G.hn Global Configuration' and contains a table of settings. The 'Subscriber Model' setting is highlighted with a red circle and is set to 'Port-Aware'. Other settings include 'Double Tagging Default NNI Port' (10G 1), 'Endpoint Automatic Firmware Upgrade' (Enable), 'Shelf Seed Index' (1), and 'Use Automatic Notch' (Enabled). 'Save' and 'Reset' buttons are located at the bottom of the configuration area.

G.hn Global Configuration	
Subscriber Model	Port-Aware
Double Tagging Default NNI Port	10G 1
Endpoint Automatic Firmware Upgrade	Enable
Shelf Seed Index	1
Use Automatic Notch	Enabled

Save Reset

8 Known Limitations, Outstanding and Resolved Issues:

As part of the testing activities by the Calix and Positron lab, the following limitations and known issues are present in version 2.0 of the GAM. Several issues found in the previous preliminary revision 1.6 are documented below. Positron is actively working on resolving these issues and limitations by the time we release a Generally Available (GA) Version 2.0

Issue	Description	Notes
Upgrade of the GAM FW is not supported via the OLT	The current pre-release V2.0 version does not allow a firmware upgraded from the OLT	Please follow the GAM firmware procedure discussed earlier in this document. This limitation will be addressed via a FW update of the GAM that will then unlock subsequent updates via the OLT.
P-XGS-PON-ONT may not accept a firmware upgrade or appears to lock up	Occasionally, an attempt by the GAM to update the firmware of the P-XGS-PON-ONT may fail and/or cause the SFP+ to lose connection with the GAM. A power cycle of the GAM is required to recover from this situation.	This issue has been fixed with V2.0.
Duplicate G.hn endpoint address associated to different subscribers will cause an outage	The issue occurs when the mistakenly duplicating an associated-endpoint-mac-address for different subscribers on a GAM. This will impact the services already assigned to the subscriber using the G100x Endpoint matching the duplicate MAC address. There are no alarms or errors.	Positron will add validation for this mistake to make sure it does not impact existing subscribers and their services. An error and an alert will report this condition.
IGMP Snooping is not yet supported.	The GAM is not performing IGMP snooping and therefore every subscriber joining into the video VLAN will get all multicast content requested by any other subscriber on that GAM. This does not affect service, as the gateway will ignore unrequested channels, but bandwidth is being consumed at all times and may result in undesirable Speed-Test results.	This issue is fixed with version 2.0

Ingress traffic metering may not always be updated correctly after a change	When applying modified policy-maps to existing / active services, the upstream traffic may be restricted to a value that was no longer applied to the service. This may result in no ingress traffic being allowed at all.	This issue is fixed with version 2.0
DHCP traffic is not currently segregated to specific subscriber interfaces	The GAM is sending downstream broadcast DHCP messages to all subscriber interfaces on the same VLAN. Downstream DHCP messages should only be forwarded to the subscriber interface involved in the DHCP handshake.	Positron is investigating this issue and will make sure it is fixed as part of the GA version 2.0
The <i>oper-state</i> reported for an ONT Gigabit Ethernet interface reflects whether an IP address is assigned via DHCP or not	The <i>oper-state</i> should represent the physical state of the GigE port of the G100x Endpoint.	This issue is fixed with version 2.0
The P-XGS-PON-ONT reports the same MAC address for the ONU MAC and the MTA MAC	Calix ONTs use the ONU MAC to allow DOCSIS systems to provision a data service on the ONT. The MTA MAC is used for DOCSIS systems to provision voice services on the ONT. MTA MAC is defined on Calix ONTs as "ONU MAC + 1". Since the G100x do not have a built-in MTA, this field should report as blank.	Positron is investigating this issue and will make sure it is fixed as part of the GA version 2.0
Double VLAN Tagging is not supported over XGS-PON	The GAM currently supports a single VLAN tag on the GigE port of the G100x Endpoint connected to the client device	This is fixed with version 2.0
VLAN 3 is reserved for the communication between the GAM and the P-XGS-PON-ONT	Subscribers and their services must not be provisioned for VLAN 3	Positron may remove this limitation in a future firmware update of the GAM.
DDMI alarm thresholds are not set in the P-XGS-PON-ONT device	This will generate unnecessary alarms in the SYSLOG of the GAM.	This issue is fixed with version 2.0 Please refer to Appendix B for more details on the issue.

A single P-XGS-PON-ONT can be used per GAM device	Version 2.0 supports a single P-XGS-PON-ONT device, even on indoor GAM with 2 x SFP+ ports.	This limitation will be removed in a future firmware update of the GAM.
The AXOS implementation does not allow the configuration of the 2 nd GigE port of a G1002-series Endpoint.	When provisioning a subscriber and associated services for one of the GigE ports of the ONT, AXOS does not currently allow services to be assigned to a sub-interface (in this case the 2 nd port of a G1002-series Endpoint).	No resolution yet about addressing this limitation of AXOS.

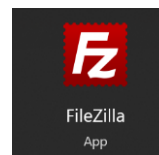
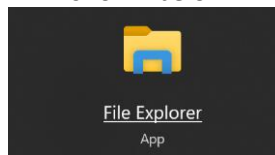
9 Appendix A: GAM Firmware Update Procedure for Version 2.0

As stated earlier, GAM firmware revisions prior to release 1.5.3 support a maximum firmware file size of 32 MB which was adequate to hold the GAM firmware itself and the firmware of the various G.hn endpoint devices supported by the GAM. Starting with version 2.0, the GAM firmware now also includes the firmware for the P-XGS-PON-ONT, and the file size now exceeds the 32MB limit.

As part of firmware 1.5.3, this limitation has been removed. Installing version 1.5.3 does not require the update of the G.hn endpoint devices since it will be immediately replaced by version 2.0.

Here is a step-by-step procedure to download and activate version 1.5.3 on the GAM:

1. Use windows File Explorer app or a FTP client like Filezilla to open connection with Positron FTP Server with link shown below.



<ftp://ftp.positronaccess.com/GAM/>

Note: Do not use any Web Browsers due they block ftp downloads.

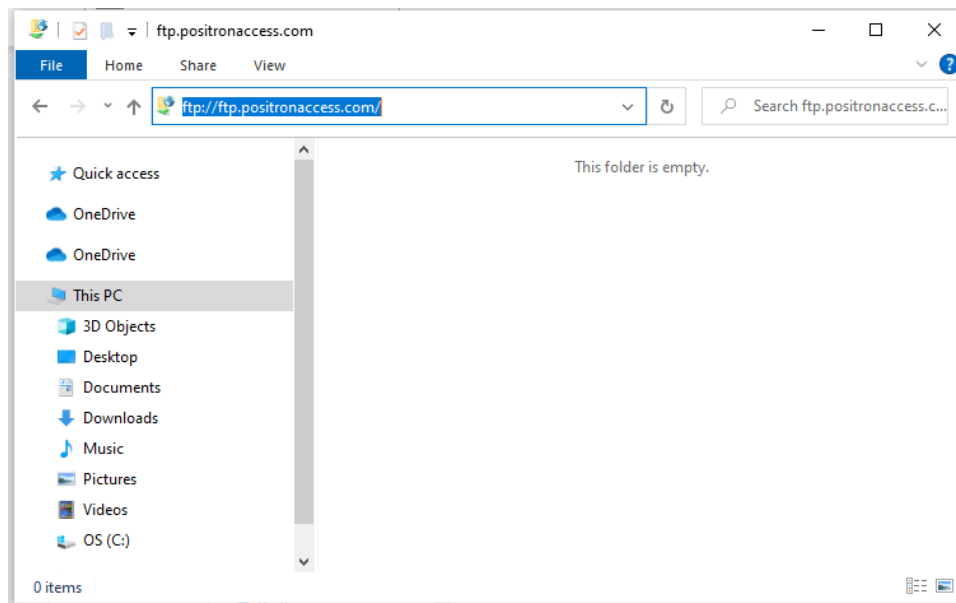


Figure 1 Connecting with Positron FTP Server using File Explorer

- Once the Log On window be prompted, use the following credentials:

Username: positron

Password: positron

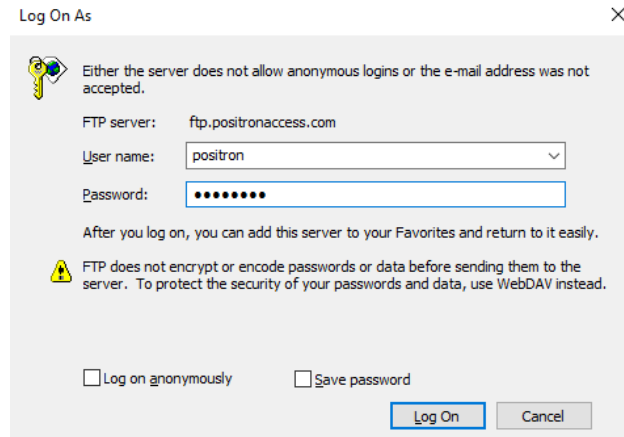


Figure 2 FTP Log On window

- Select GAM folder and open it by double clicking on it.

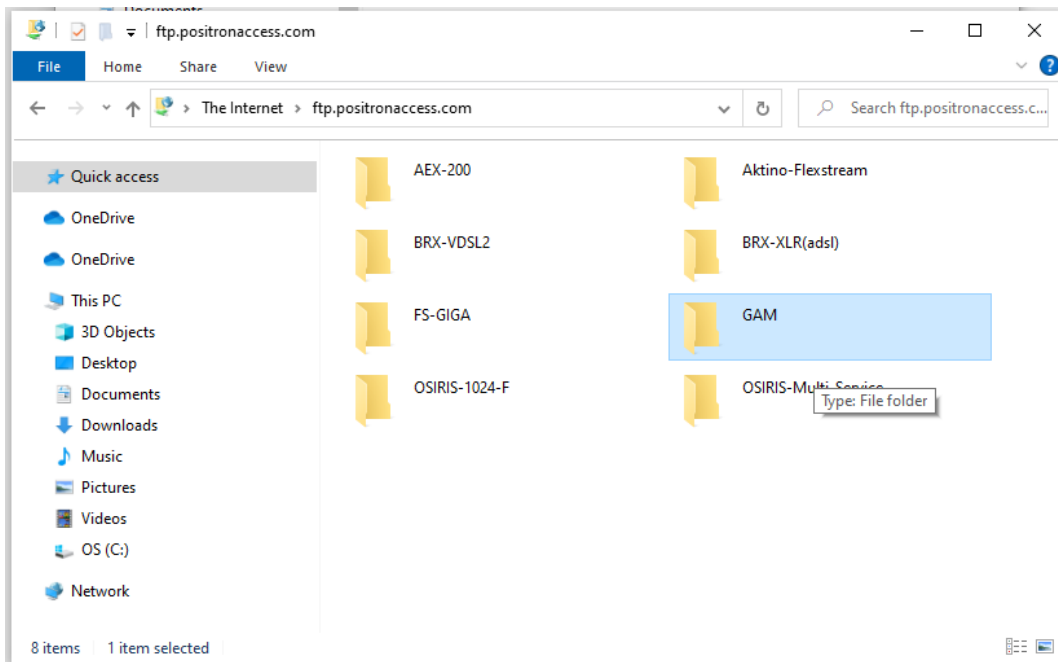


Figure 3 GAM folder in Positron FTP Server

- For GAM working with G1002 and G1001 Endpoint series go to folder **3-NEW-latest-v1.5** (see **Figure 4**)

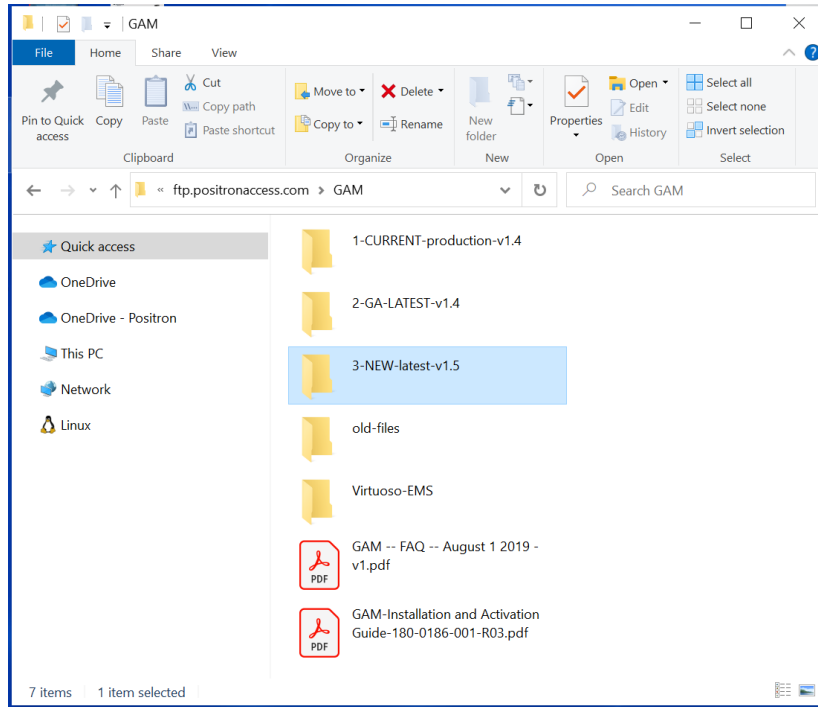


Figure 4 Folder with SW for GAM working with G1002

- Each GAM type, indoor/outdoor/MIMO/Coax has a different folder. (see **Figure 5**),

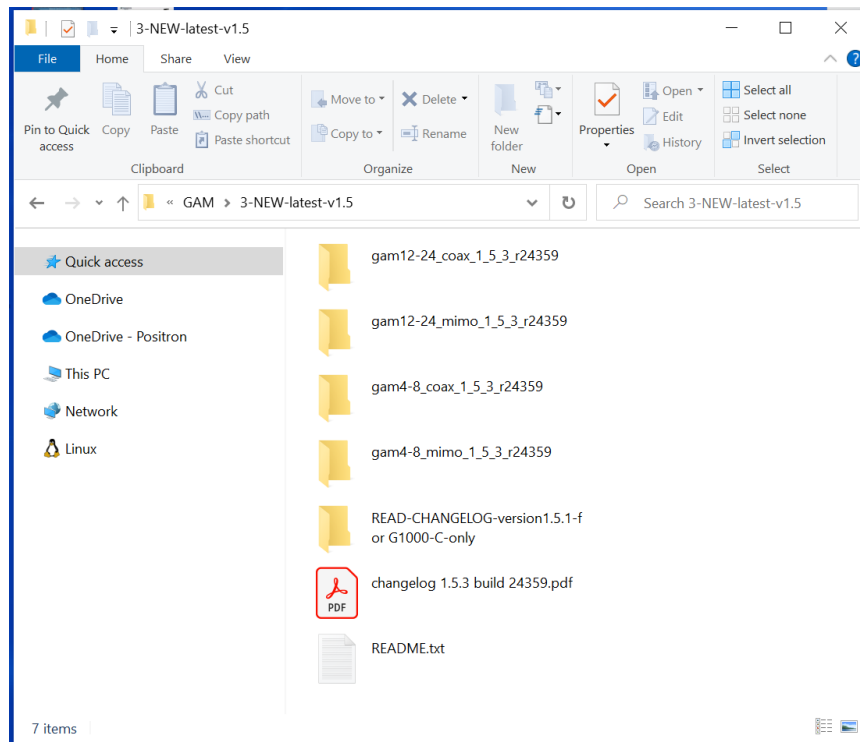


Figure 5 Folders with SW for different models of GAM

- a. **gam12-24_coax_1_X_0_r2XXXX** is for Indoor **GAM-12-C** or **GAM-24-C**
- b. **gam12-24_mimo_1_X_0_r2XXXX** is for Indoor **GAM-12-M** or **GAM-24-M**
- c. **gam4-8_coax_1_X_0_r2XXXX** is for Outdoor **GAM-4-CX** or **GAM-4-CRX**
- d. **gam4-8_mimo_1_X_0_r2XXXX** is for Outdoor **GAM-4-MX** , **GAM-8-MX**, **GAM-4-MRX** or **GAM-8-MRX**

6. Once you locate the right folder, open it and proceed to download the file with “.mfip” extension into your PC, see **Figure 6**. For Example: for a GAM12/24-M the file will be ftp://ftp.positronaccess.com/GAM/3-NEW-latest-v1.5/gam12-24_mimo_1_5_3_r24359/

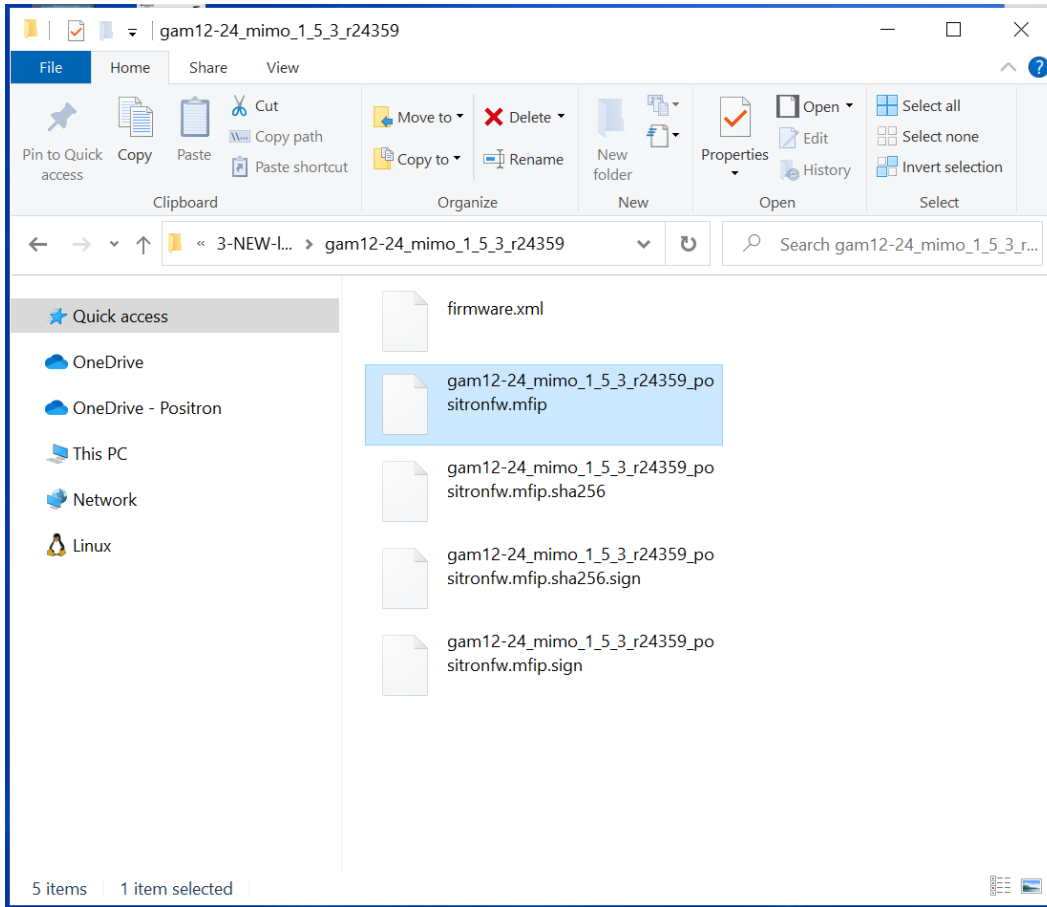


Figure 6 Software load for GAM 12/24-M working with G1002 series

The GAM doesn't validate if it is the proper file for the GAM model, it is important to upload the good file.

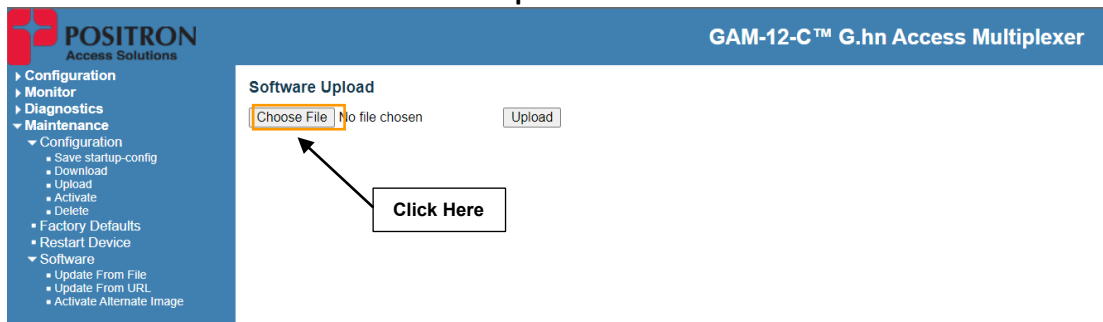
IMPORTANT NOTE-1: IF YOU ARE RUNNING A VERSION PRIOR OF 1.5.1 AND HAVE LEGACY G1000-C (COAX ONLY) IN YOUR NETWORK, YOU MUST UPGRADE TO V1.5.1 PRIOR TO UPGRADE TO 1.5.3, IF NOT, YOU WILL BE STUCK WITH ENDPOINTS THAT WILL NEVER UPGRADE.

IMPORTANT NOTE-2: IF THE GAM IS RUNNING A VERSION OLDER THAN 1.2.0(BUILD r21298), THERE IS A RARE CASE OF FLASH CORUPTION THAT CAN OCCUR DURING THE UPGRADE. CHECK WITH SALES ENGINEERING TEAM FIRST.

7. Download the **.mfip** file to your PC.
8. Open The GAM Web GUI on your PC.
9. Copy running-config to startup-config of the GAM by doing click on disk symbol located in top right corner of Web GUI as shown below or from menu **Maintenance**→**Configuration**→ **Save startup-config**



10. Under **Maintenance**→**Software** select **Update From File**



11. Click on **Choose File** button to locate the **.mfip** file located on your PC then press **Open** button to confirm. This will launch the firmware file download to the GAM.
12. It will take a few minutes and the system will reboot the GAM automatically once the software load is copied into the flash. (Upgrade takes around 5-10 mins)
13. Once the GAM upgrade is completed, a message will appear in Web GUI confirming it.

14. Go to **Monitor**→**System**→**Information** to confirm that the GAM is working with new software version and release.

POSITRON
Access Solutions

- ▶ Configuration
- ▼ Monitor
 - ▼ System
 - Information ←
 - CPU Load
 - IP Status
 - NTP status
 - Log
 - Detailed Log
 - ▶ Aggregation
 - ▶ Alarms
 - ▶ DDMI
 - ▶ DHCP
 - ▶ G.hn
 - ▶ IPMC
 - ▶ Link OAM
 - ▶ LLDP
 - ▶ MAC Table
 - ▶ MVR
 - ▶ MVRP
 - ▶ Performance Monitor
 - ▶ PPPoE
 - ▶ Ports
 - ▶ Private VLANs
 - ▶ PTP
 - ▶ Security
 - sFlow
 - ▶ Spanning Tree
 - ▶ VLANs
- ▶ Diagnostics
- ▶ Maintenance

System Information

System	
Contact	support@positronaccess.com
Name	
Location	LAB 2nd floor
Hardware	
MAC Address	00-0e-d8-13-7f-7e
FPGA Version (main board)	20
FPGA Version (expansion card)	Unavailable
Hardware Version	ASY-2100-21,R05
Serial Number	01031766
NOR Flash Model	n25q512ax3
MGMT PHY Model	vsc8211
Temperatures	
CPU	35.8(C), 96.5(F)
Intake #1	31.3(C), 88.4(F)
Intake #2	32.8(C), 90.9(F)
Exhaust #1	33.0(C), 91.4(F)
Exhaust #2	29.9(C), 85.9(F)
Fans	
Fan #1	6661 rpm
Fan #2	6706 rpm
Fan #3	6751 rpm
Fan #4	6661 rpm
Time	
System Date	2023-08-04T16:29:20+00:00
System Uptime	10d 21:35:58
Software	
Bootloader Version	1_4-20974
Software Version	GAM-12/24-C v1.5.3
Software Date	2023-07-21T00:07:57-04:00
Code Revision	24359
Acknowledgments	Details

With version 1.5.3 loaded on the GAM, you are now ready to install version 2.0 to enable support for the P-XGS-PON-ONT. Simply repeat the above procedure with the firmware file for V2.0.

Software	
Bootloader Version	1_4-22776
Software Version	GAM-12/24-C v2.0.0
Software Date	2023-09-09T01:08:14-04:00
Code Revision	24587
Acknowledgments	Details

9.1 SFP+ ONT Firmware Update Procedure (via CLI)

With the current beta version 2.0, the CLI interface of the GAM must be used to update the firmware of the P-XGS-PON-ONT SFP+.

Use the SHOW ONT command to retrieve detailed information about the SFP+ ONT. You will need to use the MAC address for the firmware update command.

```
# show ont
ONT mode is enabled
ONT IP address: 169.254.8.254
# show ont discovery
Device #1
-----
MAC       : 00:0E:D8:18:56:50
IP address : 169.254.8.254
Identity  : prx126-sfp-pon
FSAN      : PNIDD8185650
Serial    : 99000278
HW version : ASY-2127-00,R02
SW bank A : 1.1.0_24413
Valid Bank A : true
SW bank B : 1.0.0_24273
Valid Bank B : true
SW commit bank : A
Uptime    : 2d 22:13:18
```

Use the MAC address of the SFP+ obtained above to update its firmware as shown below:

```
# ont firmware upgrade 00:0E:D8:18:56:50
#
Done
```